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## Metallic materials — Tensile testing — Part 1: Method of test at room temperature

*Matériaux métalliques — Essai de traction —  
Partie 1: Méthode d'essai à température ambiante*

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 164, *Mechanical testing of metals*, Subcommittee SC 1, *Uniaxial testing*.

This third edition cancels and replaces the second edition (ISO 6892-1:2016), of which it constitutes a minor revision. The changes compared to the previous edition are as follows:

<https://standards.iteh.ai/iso/6892-1-2019/c11b9-01-8c5d-47f1-8938-3b0988f421ff/iso-6892-1-2019>

- correction of the title of a standard in [Clause 2](#);
- correction of the designation "coefficient of determination" ("coefficient of determination" instead of "coefficient of correlation");
- correction of [Formula \(1\)](#);
- wording in [10.3.2.1](#);
- wording in the key of [Figure 9](#);
- wording in [Table B.2](#);
- wording in [Table D.3](#);
- correction of the references.

A list of all parts in the ISO 6892 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

## Introduction

During discussions concerning the speed of testing in the preparation of ISO 6892, it was decided to recommend the use of strain rate control in future revisions.

In this document, there are two methods of testing speeds available. The first, method A, is based on strain rates (including crosshead separation rate) and the second, method B, is based on stress rates. Method A is intended to minimize the variation of the test rates during the moment when strain rate sensitive parameters are determined and to minimize the measurement uncertainty of the test results. Therefore, and out of the fact that often the strain rate sensitivity of the materials is not known, the use of method A is strongly recommended.

**NOTE** In what follows, the designations “force” and “stress” or “extension”, “percentage extension”, and “strain”, respectively, are used on various occasions (as figure axis labels or in explanations for the determination of different properties). However, for a general description or point on a curve, the designations “force” and “stress” or “extension”, “percentage extension”, and “strain”, respectively, can be interchanged.

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# Metallic materials — Tensile testing —

## Part 1: Method of test at room temperature

### 1 Scope

This document specifies the method for tensile testing of metallic materials and defines the mechanical properties which can be determined at room temperature.

NOTE [Annex A](#) contains further recommendations for computer controlled testing machines.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 7500-1, *Metallic materials — Calibration and verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Verification and calibration of the force-measuring system*

ISO 9513, *Metallic materials — Calibration of extensometer systems used in uniaxial testing*

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

<https://www.iso.org/obp> ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

#### 3.1

##### **gauge length**

$L$

length of the parallel portion of the test piece on which elongation is measured at any moment during the test

###### 3.1.1

###### **original gauge length**

$L_o$

length between *gauge length* (3.1) marks on the test piece measured at room temperature before the test

###### 3.1.2

###### **final gauge length after fracture**

$L_u$

length between *gauge length* (3.1) marks on the test piece measured after rupture, at room temperature, the two pieces having been carefully fitted back together so that their axes lie in a straight line